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FURTHER EVALUATION OF THE ROLE OF PROTECTIVE EQUIPMENT IN THE FUNCTIONAL ANALYSIS OF SELF-INJURIOUS BEHAVIOR

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Using a procedure similar to the one described by Le and Smith (in press), we evaluated the effects of protective equipment during a functional analysis for 2 individuals who engaged in severe self-injurious behavior (SIB). Results of our analyses revealed that the use of protective equipment during functional analyses of SIB suppressed levels of responding such that a behavioral function could not be identified.

DESCRIPTORS: self-injury, protective equipment, functional analysis, trichotillomania

One common method to treat self-injurious behavior (SIB), or at least to protect individuals from the detrimental sequelae of SIB, is the use of protective equipment (Dorsey, Iwata, Reid, & Davis, 1982). In some cases, protective equipment may reduce the frequency of SIB and may reduce the medical, social, and economic impact of the behavior by limiting the degree of injury. Currently, little is known about the influence of protective equipment in conducting functional analyses. The advantage of using protective equipment during a functional analysis is a practical one; it may reduce the risk of injury and allow for a more intensive analysis. On the other hand, one potential disadvantage of its use is that the operant function of the behavior may be masked.

Le and Smith (in press) evaluated the effects of protective equipment with 3 individuals who engaged in SIB. First, all participants were exposed to a functional analysis without protective equipment. Next, analyses were conducted with protective equipment, using the same sequence and number of assessment conditions. Results of the assessment showed different patterns for all participants in conditions with and without protective equipment.

The purpose of the current investigation was twofold. First, we attempted to replicate the procedures described by Le and Smith (in press) with a similar topography of SIB (i.e., head hitting and head banging). Second, we extended the methods described by Le and Smith by evaluating trichotillomania (hair pulling) to further evaluate the effects of protective equipment.

METHOD

Participants, Setting, and Data Collection

The participants were Dexter, an 8-year-old boy who had been diagnosed with profound mental retardation, and Dylan, a 35-year-old man who had been diagnosed with moderate mental retardation and Down syn-

A portion of these data were collected while John Borrero, Tim Vollmer, and Carrie Wright were at the University of Pennsylvania and Children's Seashore House.

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drome. Dexter had been referred for the assessment and treatment of head hitting and head banging. Dylan had been admitted to an inpatient facility for the assessment and treatment of trichotillomania. Prior to being admitted to the hospital, he had pulled out his hair to such an extent that hospitalization, including reconstructive surgery, was required to treat severe tissue damage.

Observers were seated behind a one-way window (Dylan) or unobtrusively in the room (Dexter) and used laptop computers to record target behaviors. Interobserver agreement was calculated using the methods described by Le and Smith (in press). For Dylan, interobserver agreement was recorded during 35% of sessions and exceeded 90% across all sessions. For Dexter, agreement was recorded during 81% of sessions and exceeded 95% across all sessions.

Sessions were conducted in a therapy room at the inpatient facility (Dylan) or in an available room in Dexter's home. Sessions were conducted two to four times per day, 5 days per week. Sessions were 10 min long, with the exception of the extended no-interaction sessions (Dexter), which were 30 min long.

Protective Equipment

A baseball cap and clean gauze, applied to his head, were selected for Dylan, and a helmet was selected for Dexter, because these items were usually worn throughout the day. The items provided protection from infection and irritation (Dylan) and severe tissue damage (Dexter) but did not physically prevent occurrences of SIB.

Functional Analysis

Evaluation of the protective equipment was conducted using a combination multielement and reversal design. Five conditions were alternated in a multielement design using procedures similar to those described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994). Briefly, the conditions were alone or no interaction, attention, tangible, escape, and control. In the alone condition, Dylan was seated in a chair with a pen and notepad. Therapists were not present during the alone condition. In the no-interaction condition, Dexter was observed by therapists seated in the room; however, SIB, produced no programmed consequences. In the attention condition, the participant was seated in a chair and given access to leisure materials; SIB produced brief attention from the therapist. In the tangible condition, the participant received approximately 1 to 2 min of access to a preferred leisure activity. Following 1 min of access, the items were withdrawn from the participant's reach. The programmed consequence for SIB in this condition was access to the leisure activity for approximately 20 s. In the escape condition, the participant was seated in a chair without access to leisure materials. Task demands were presented approximately every 30 s using a three-prompt hierarchy; SIB produced termination of the task until the next scheduled interval. In the control condition, the participant was seated in a chair with leisure materials available. No demands were presented, and attention was delivered on a fixed-time 20-s schedule (at a minimum). SIB resulted in no programmed consequences from the therapist.

A replication of the procedures described by Le and Smith (in press) was conducted with Dexter, but the procedures were varied slightly for Dylan and the order of conditions was reversed. That is, in the first functional analysis condition, protective equipment was on, and in the second condition, it was off. Also for Dylan, the sequence of conditions was randomly selected for each of the first two phases of the assessment. Dylan's equipment consisted of two discrete components (i.e., baseball hat and gauze wrap) rather than a single component. Fi-

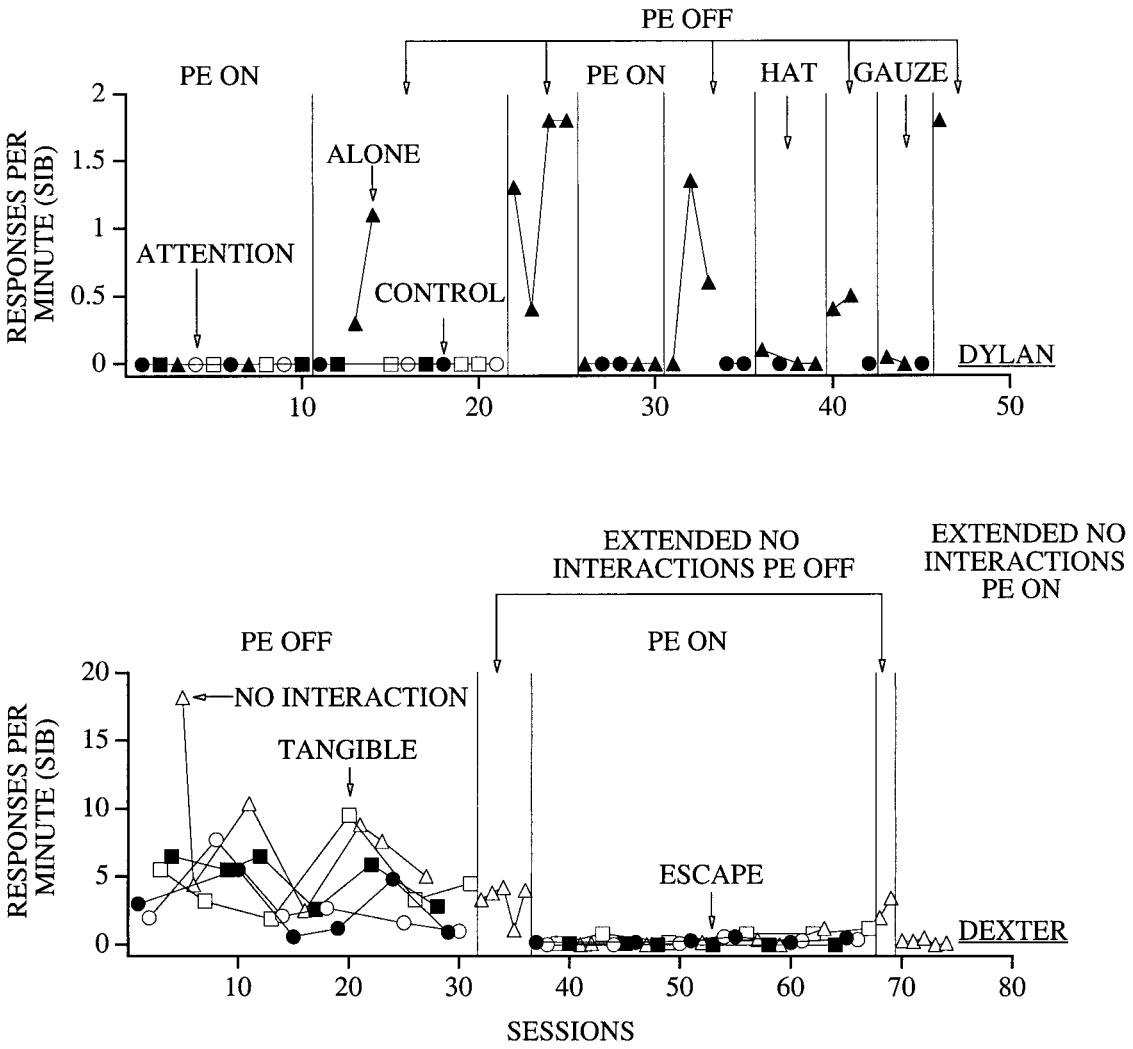

Figure 1. Results of the functional analysis for Dylan (upper panel) and Dexter (lower panel).

nally, for both participants, a tangible condition was included in the functional analysis, whereas Le and Smith did not include a tangible condition.

RESULTS AND DISCUSSION

The upper panel of Figure 1 shows the results for Dylan. During the first phase, zero instances of SIB were observed. In the second phase, protective equipment was removed and SIB was observed exclusively in the alone condition (M = 0.7 responses per minute). Next, four consecutive alone sessions were conducted with the protective equipment off. Within-session patterns revealed that Dylan's SIB persisted across observations, suggesting that his self-injury was automatically reinforced (M = 1.3). In a return to the equipment-on condition, alone and control conditions were presented, and zero instances of SIB were observed. Removing the protective equipment resulted in rates similar to those obtained in previous alone conditions in which the equipment was not worn (M = 0.65), whereas zero in-

stances of behavior were observed in the control condition.

As noted previously, Dylan's protective equipment consisted of two components, a baseball hat and a gauze wrap. A component analysis revealed that when only the baseball hat or the gauze was worn, levels of SIB were suppressed during the alone condition (M = 0.03 for each). A final probe reversal to the no-equipment alone condition resulted in an increase in the rate of SIB (1.8 responses per minute).

Results of Dexter's assessment appear in the lower panel of Figure 1. The results of Phase 1 (equipment off) did not identify a clear function of Dexter's SIB. Rates of SIB were elevated in each of the conditions and persisted in the extended no-interaction sessions. Based on these results, we concluded that Dexter's SIB was maintained by automatic reinforcement. Next, the same sequence of functional analysis conditions was conducted with the equipment on, and suppression of SIB was observed. A reversal to the extended no-interaction condition with equipment on produced levels of SIB similar to those observed during the multielement assessment with equipment on (M = 2.7). Finally, a return to the extended no-interaction condition with equipment on resulted in a suppression of overall response rate (M = 0.24).

These results provide further support for the results obtained by Le and Smith (in press). The use of protective equipment during the assessment of SIB has been shown to influence the results of functional analyses. For 2 participants, the inclusion of protective equipment during the functional analysis resulted in suppression (Dexter) or elimination (Dylan) of SIB. In addition, the current investigation extends the growing literature on the automatic reinforcement function of trichotillomania (e.g., Miltenberger, Long, Rapp, Lumley, & Elliott, 1998).

Clinically, the results of the current investigation point to at least one potential intervention for SIB. The use of protective equipment to reduce levels of SIB may itself be an effective intervention if a fading method is incorporated (Dorsey et al., 1982). However, the inclusion of protective equipment during a functional analysis makes the operant function difficult to identify.

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